***Mutations***

Point Mutations

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_-occur in a single point in the DNA sequence.

These mutations include, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Substitution

One \_\_\_\_\_\_\_\_\_ is changed into a completely different base.

Usually affects only one \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_, sometimes has no affect at all.

Frame shift Mutations

Frame shift mutations are also known as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. These change the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of genetic messages.

Because the reading frame shifts, the insertions and deletions can change every \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ that follows it.

Sometimes these can change a \_\_\_\_\_\_\_\_\_\_ so much they can’t perform normal functions.

If the number of nucleotides is not divisible by three, the mutation can be \_\_\_\_\_\_\_\_\_\_\_\_\_.

Insertions

An insertion is too many \_\_\_\_\_\_\_\_\_\_\_\_\_\_ in a DNA sequence. For example, the bases A, T, and C are paired with T, A, and G. An insertion would be adding another base, such as G, and shifting the codon reading.

Draw a diagram of an insertion into a DNA sequence.

Deletions

A deletion is taking out one or more nitrogen bases. This causes a \_\_\_\_\_\_\_\_\_\_ in the DNA sequence too. This may also lead to an alteration in the \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ sequence at the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ of proteins.

There are two types of mutations \_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_.

Draw a deletion in a DNA sequence

Chromosomal Mutations

It involves the number or structure change in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Chromosomal mutations can even change the number of copies of some \_\_\_\_\_\_\_\_\_\_. The location can also change.

The structure can change in four ways. Inversion, deletion, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Draw an example of inversion.

Draw an example of deletion

Draw and example of duplication

Draw and example of translocation

Mutagens

\_\_\_\_\_\_\_\_\_\_\_\_\_\_- Chemical or physical agents in the environment

Types of mutagens \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Some physical mutagens

Electromagnetic radiation

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are types of electromagnetic radiation

If not \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ then the DNA base is changed permanently

DNA \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ causes the mutation to grow at faster rate

Mutagens also cause DNA strands to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, which is known as Chromosomal Mutations

Effects of Mutations

Genetic material can be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ by natural or artificial means

How are mutation produced?

The cellular machinery that replicates DNA inserts the incorrect base every 10 million bases

Harmful Mutations

Dramatically change \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Structure.

Defective proteins can disrupt normal biological activities, which result in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ disorders.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cell is a mutation of red blood cells where the shape is no longer round. This can also occur in somatic cells.

If this mutation occurs in the sex cell the \_\_\_\_\_\_\_\_\_\_\_ can be in all of the offspring.

Beneficial Effects

Mutations are produced through \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

These have \_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_ functions to help an environment.

A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is an organism that has extra sets of chromosomes and happens naturally in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ plants.